



# **Aliso Canyon Gas Leak**

## ***Results of Air Monitoring and Assessments of Health***

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## Department of Public Health Activities

- Consolidate, analyze and report on results of air monitoring performed by:
  - Southern California Gas
  - Southern California Air Quality Management District
  - California Air Resources Board
  - Los Angeles County Unified School District
- Assess Health Impacts on Residents in Surrounding Communities
- Assess Health Impacts on Pets and Animals in the Community

## Chemicals of Concern

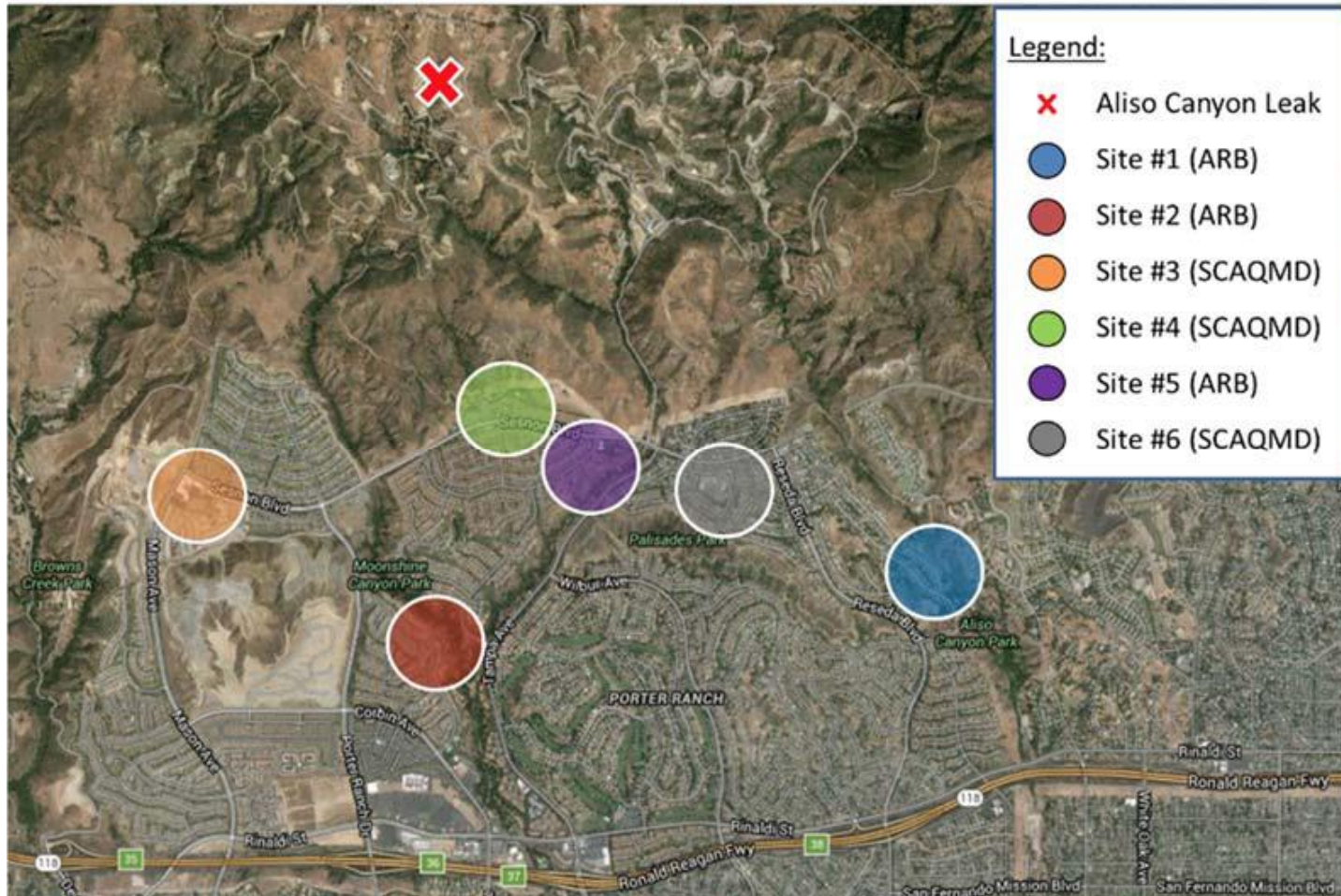
1. Methane
2. Sulfur Odorants
3. Benzene and related chemicals

## SoCalGas Air Sampling Locations





## SCAQMD and CARB Real-time Methane Monitoring



## Within Facility Cumulative “Grab” Sample Summary

**Source** Southern California Gas Company  
**Type** “Grab” (10-minute) samples  
**Dates** October 30 - January 11  
**Chemicals Tested** Methane, Other Hydrocarbons, BTEX, Sulfur Compounds

Chemical	Within Facility						
	Number Detected	Total / Samples	% Detects	Range (Min-Max)	Average*	Health Protective Levels	Units
Methane	1080	/ 1080	100.0%	1.3 - 4340	59.7	50,000**	ppm
Benzene	363	/ 1079	33.6%	0.05 - 30.6	1.3	1,000***	ppb
tert-Butyl Mercaptan	0	/ 1044	0.0%	ND	NA	N/A	ppb
Tetrahydrothiophene	0	/ 1040	0.0%	ND	NA	N/A	ppb

ppm = parts per million; ppb = parts per billion; ND = non-detectable; NA = not available

\*Average of detected concentrations.

\*\*Lower explosive limit.

\*\*\* Occupational permissible exposure limit.

## Within Facility Cumulative 12-hour Summary

Source Southern California Gas Company  
Type 12-Hour Samples  
Dates January 12 - January 27  
Chemicals Tested Methane, BTEX, Sulfur Compounds

Chemical	Within Facility							
	Number Detected	Total / Samples	% Detects	Range (Min-Max)	Average*	Health Protective Levels	Units	
Methane	96	/ 96	100%	2.6 - 720	64.1	50,000**	ppm	
Benzene	96	/ 96	100%	0.08 - 8.4	0.98	1,000***	ppb	
tert-Butyl Mercaptan	0	/ 96	0%	ND	NA	NA	ppb	
Tetrahydrothiophene	0	/ 96	0%	ND	NA	NA	ppb	

ppm = parts per million; ppb = parts per billion; ND = non-detectable; NA = not available

\*Average of detected concentrations.

\*\*Lower explosive limit.

\*\*\* Occupational permissible exposure limit.

## Boundary Cumulative Summary

Source Southern California Gas Company  
Type 12-Hour Samples  
Dates January 12 - January 27  
Chemicals Tested Methane, BTEX, Sulfur Compounds

Chemical	Boundary						Health Protective Levels	Units
	Number Detected	Total Samples	% Detects	Range (Min-Max)	Average*			
Methane	196	/ 196	100%	1.9 - 24	5.3	50,000**		ppm
Benzene	197	/ 197	100%	0.08 - 0.42	0.18	1.0***		ppb
tert-Butyl Mercaptan	0	/ 197	0%	ND	NA	NA		ppb
Tetrahydrothiophene	0	/ 197	0%	ND	NA	NA		ppb

ppm = parts per million; ppb = parts per billion; ND = non-detectable; NA = not available

\*Average of detected concentrations.

\*\*Lower explosive limit.

\*\*\* Chronic reference exposure limit.



## Community Cumulative “Grab” Sample Summary

Source Southern California Gas Company  
Type “Grab” (10-minute) Samples  
Dates October 30 - January 28  
Chemicals Tested Methane, Other Hydrocarbons, BTEX, Sulfur Compounds

Chemical	Community							
	Number Detected	Total Samples	% Detects	Range (Min-Max)	Average*	Health Protective Level	Background Levels	Units
Methane	1702	/ 1702	100%	1.2 - 231	8.0	50,000**	NA	ppm
Benzene	766	/ 1699	45%	0.1 - 5.6	0.38	8.0***	NA	ppb
tert-Butyl Mercaptan	0	/ 1623	0%	ND -	NA	NA	NA	ppb
Tetra-hydrothiophene	0	/ 1623	0%	ND -	NA	NA	NA	ppb

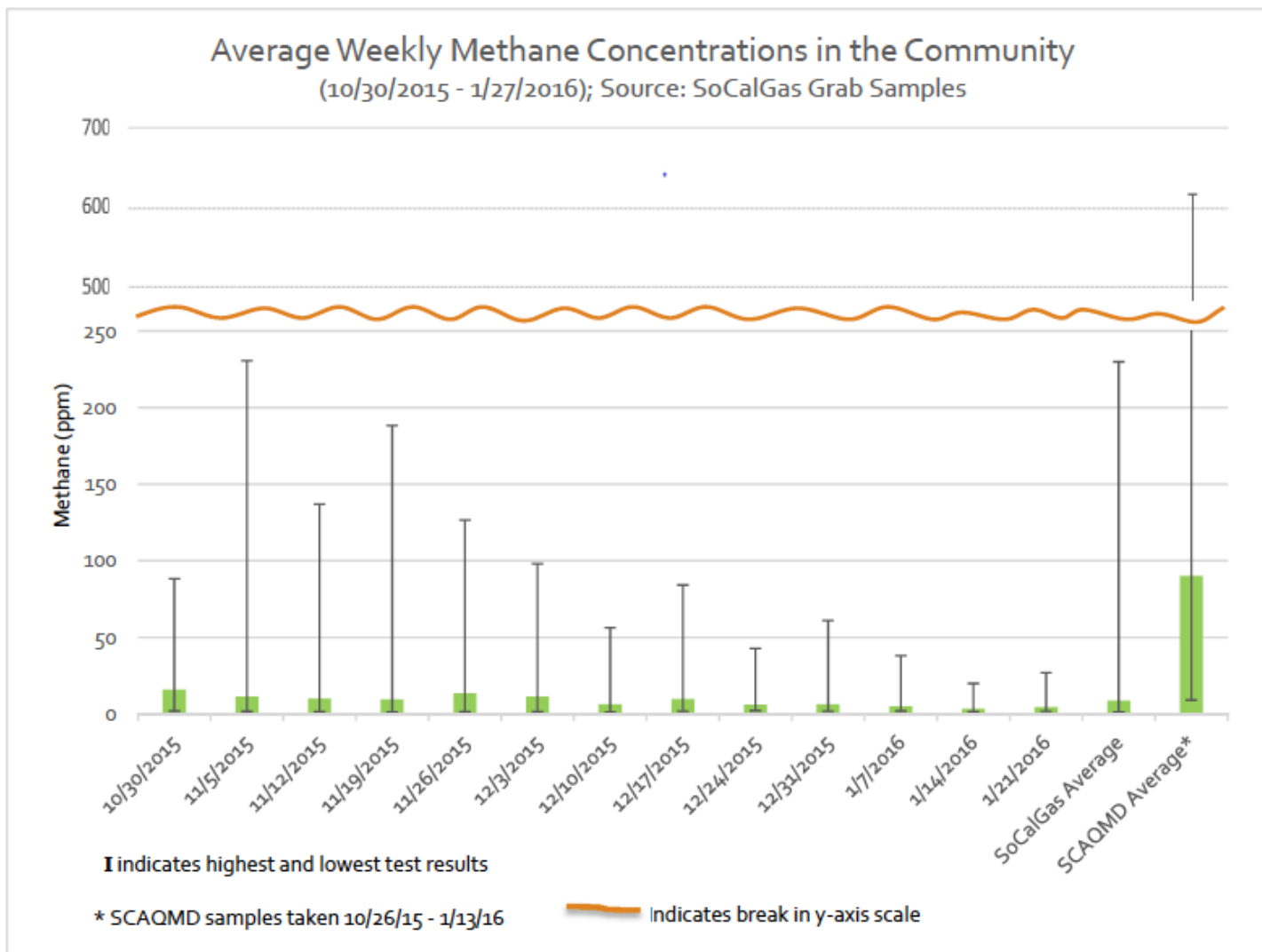
ppm = parts per million; ppb = parts per billion; ND = non-detectable; NA = not available

\*Average of detected concentrations.

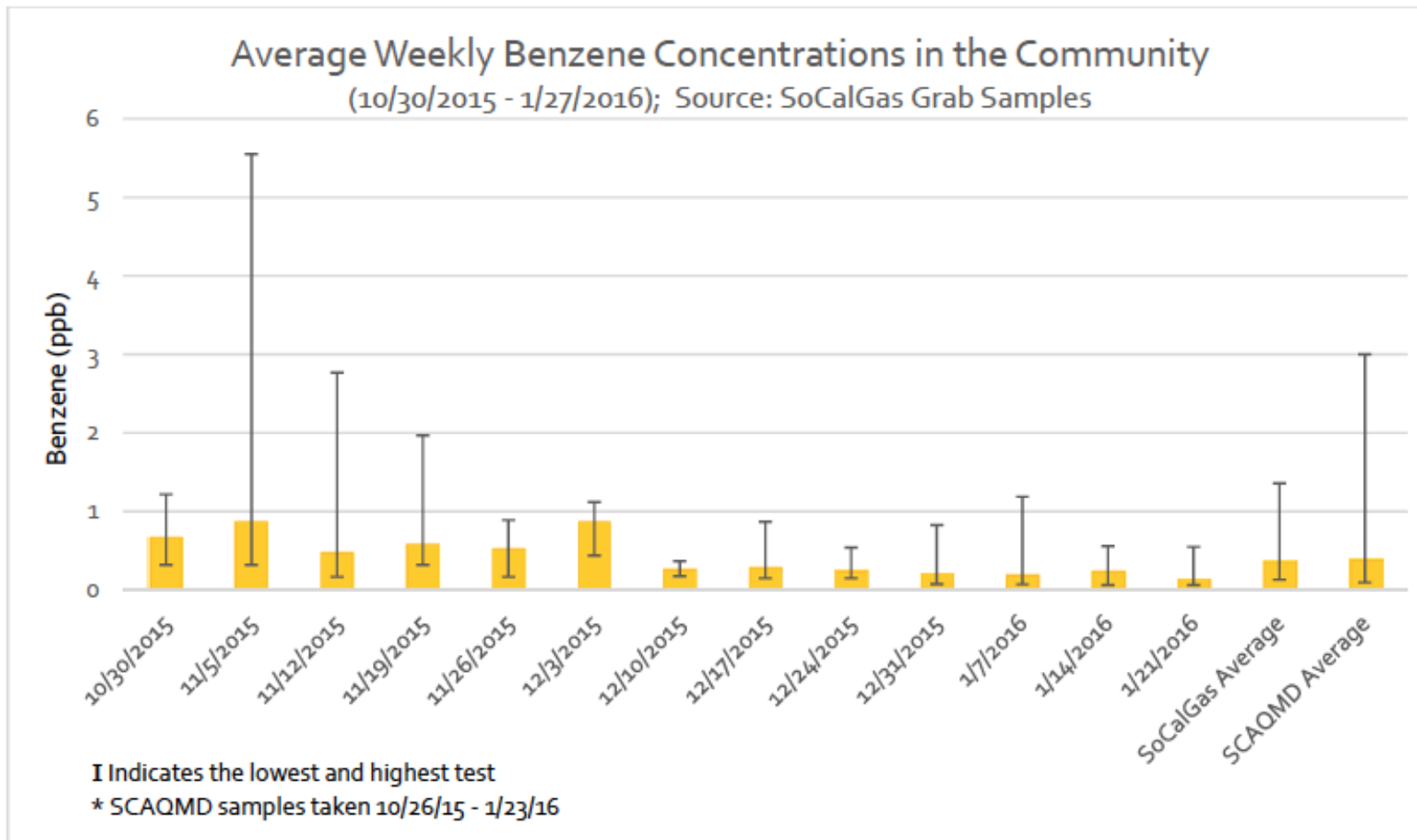
\*\*Lower explosive limit.

\*\*\* Acute reference exposure limit.

# Update: Aliso Canyon Natural Gas Leak



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## Activities to Assess Health Effects in Residents, Pets, and Other Animals

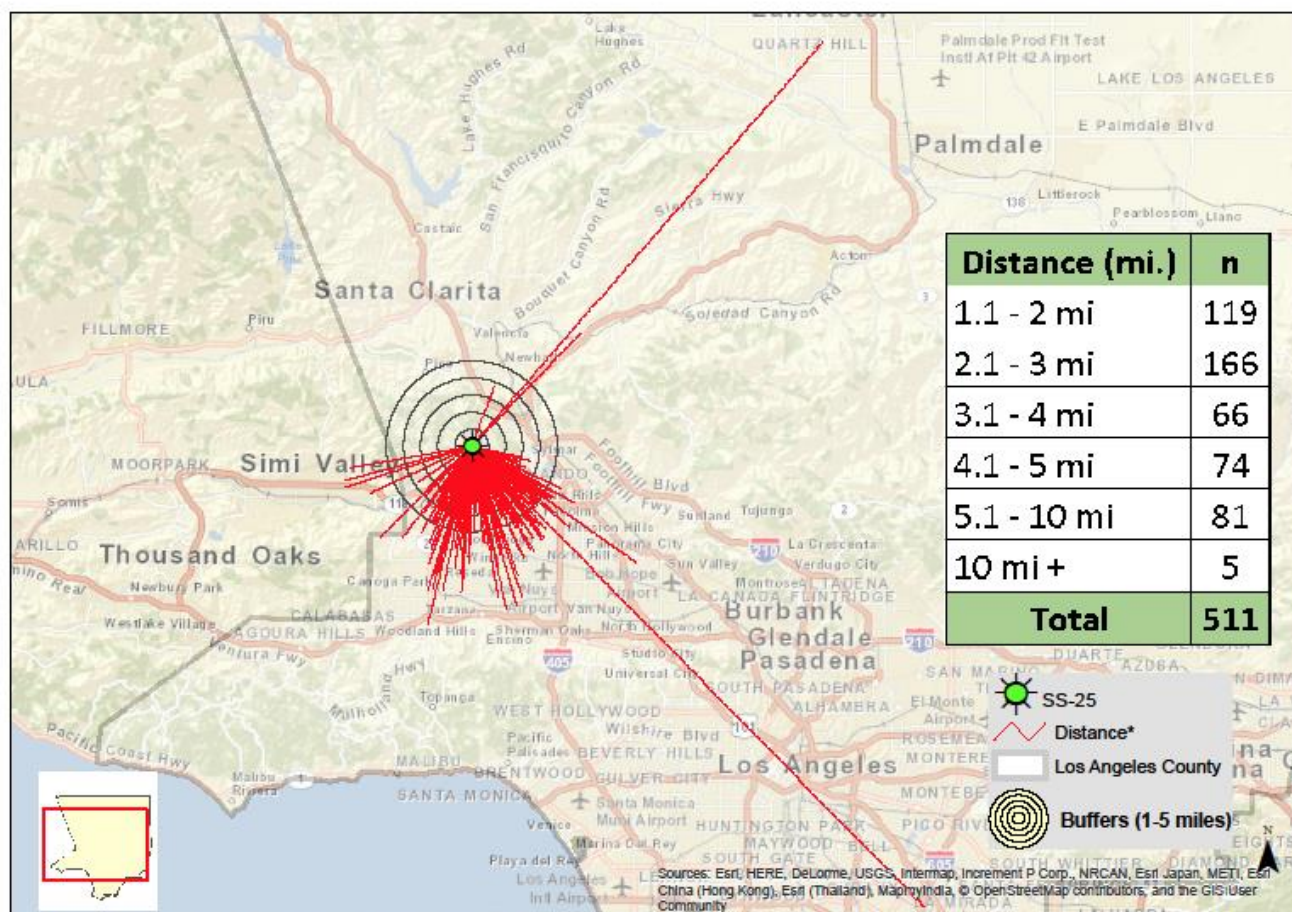
### Assessing Effects on Human Health

- Department of Public Health Complaint Line
- Community Resource Center
- Outreach to Medical Providers

### Assessing Effects on Animal Health

- Veterinary Clinic Outreach
- Outreach to Large Animal Veterinarians
- Outreach to Animal Shelters and CDFW
- Reports from Pet Owners

## -- Aliso Canyon Symptom Survey -- Respondent's Address: Distance to Leak



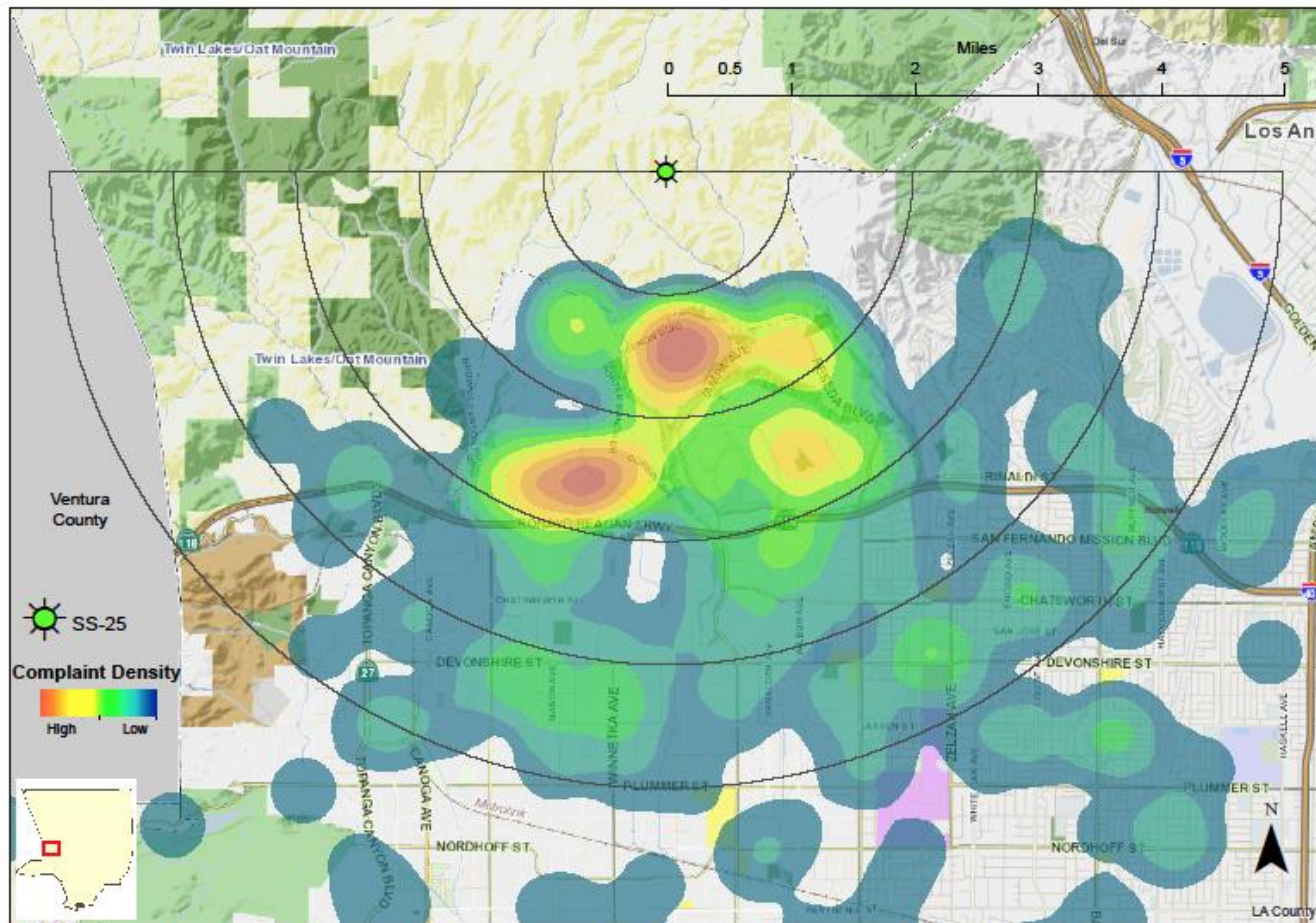
### Aliso Canyon Symptom Survey Respondent's Address\*

Created by: Office of Health Assessment and Epidemiology, Epidemiology Unit. 02/3/16. Map shows the density of Symptom Survey respondent's addresses. 511 of 687 addresses were located (the rest were excluded due to incorrect or missing addresses). \*Euclidean Distance from SS-25.





## -- Aliso Canyon Symptom Survey -- Complaint Density



### Aliso Canyon Symptom Survey Respondent's Address

Created by: Office of Health Assessment and Epidemiology, Epidemiology Unit. 02/3/16. Map shows the density of Symptom Survey respondent's addresses. 511 of 687 addresses were located (the rest were excluded due to incorrect or missing addresses).



## Summary of Symptoms/Actions Reported by Household (N=600)

61%	Headache / Migraine
40%	Nausea/Vomiting/Stomach ache/GI/Diarrhea
32%	Bloody Nose
27%	Respiratory / Breathing Symptoms
24%	Chest Tightness / Coughing / Palpitations
22%	Dizzy / Lightheaded
18%	Eye Irritation / Vision Complaints
17%	Smell / Odor
16%	Sore Throat
13%	Went to MD / ER
9%	Pet Affected
4%	Complained to SCG
0%	Complained to AQMD
10%	Relocated or Requested Relocation

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## Summary

- Public Health continues to closely monitor and interpret air quality and health data collected from within the Aliso Canyon storage facility and the adjoining community of Porter Ranch
- While methane levels have remained above normal, they have remained below the flammability limit at all locations and have decreased substantially over time
- Sulfur odorants have remained below instrument detection limits throughout the entire period, including immediately after the leak, even at locations near the leaking well. Odorants continue to present odors and cause symptoms in some members of the community.
- Benzene and other chemicals from within community sampling sites were originally detectable at levels above the average outdoor levels for the region, but peak levels remained below acute exposure thresholds.

## Summary

- Analysis of complaints and a report from one urgent care center demonstrate that many persons experienced symptoms related to the odorants.
- Collectively, air monitoring data suggest that health effects resulting from the on-going leak should be limited to short-term effects resulting from exposure to the odorants.
- Efforts to investigate claims of significant health effects in pets and other animals have not produced evidence to support these claims.
- Available information suggests that health effects resulting from the gas leak may have waned over time. Symptoms experienced by some residents may not rise to a level of significance that would require a visit to a health care provider. In addition, the rate of symptoms in the community over time may have decreased as affected individuals have relocated to locations outside of the affected area.



# Thank you

